

First Light from Extrasolar Planets and Implications for Astrobiology

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The first light from an extrasolar planet was recently detected (Deming et. al. 2005, Charbonneau et. al. 2005). These results, obtained for two transiting extrasolar planets at different infrared wavelengths, open a new era in the field of extrasolar planet detection and characterization because for the first time we can now detect planets beyond the solar system directly. Using the Spitzer Space Telescope at 24 microns, we observed the modulation of combined light (star plus planet) from the HD 209458 system as the planet disappeared behind the star during secondary eclipse and later re-emerged, thereby isolating the light from the planet. We obtained a planet-to-star ratio of 0.26% at 24 microns, corresponding to a brightness temperature of 1130 ± 150 K. We will describe this result in detail, explain what it can tell us about the atmosphere of HD 209458 b, and discuss implications for the field of astrobiology. These results represent a significant step on the path to detecting terrestrial planets around other stars and in understanding their atmospheres in terms of composition and temperature.